APPENDIX A

PETITIONS TO DENY AND COMMENTS

I. Submissions in Response to the December 21, 201. Public Notice

A. Petitions to Deny filed February 4, 2002

American Cable Association ("ACA")
Brunson Communications Inc. ("Brunson")
Carolina Christian Television Inc. and LeSea Broadcasting Corporation ("Carolina")
Communications Workers of America (CWA")
Eagle III Broadcasting. LLC ("Eagle")
Family Stations. Inc. Family Stations of New Jersey, Inc. and Nonh Pacific International Television, Inc. ("Family")
Johnson Broadcasting, Inc. and Johnson Broadcasting of Dallar, Inc. "Johnson")
National Association of Broadcasters ("NAB")
National Rural Telecommunications Cooperative ("NRTC")
Northpoint Technologies. Ltd. ("Northpoint")
Paxson Communications Corporation ("Paxson")
Pegasus Communications Corporation ("Pegasus")
Univision Communications Inc. ("Univision")
The Word Network ("Word')

B. Comments filed February 4, 2002

ACC Satellite TV ("ACC")
Aiken Electric Satellite TV Inc. ("Aiken")
The American Antitrust Institute ("AAI")
Association of Public Television Stations and the Public Broadcasting Service ("APTS")
Circuit City Stores, Inc. ("Circuit City")
Competitive Enterprise Institute ("CEI")
Consumers Union, The Consumer Federation of America. and the Media Access Project ("Consumers Union")
Intelsat Global Service Corporation ("Intersat")
National Consumers League, the National Farmers Union and the National Grange ("National Consumers League")
National Rural Electric Cooperative Association ("NRECA")
Pappas Telecasting Companies ("Pappas")
PrimeTime 24 Joint Venture ("PrimeTime 24")
Progress and Freedom Foundation ("PFF")
Public Communicators, Inc. ("Public Communicators")
Regulatory Commission of Alaska ("Alaska Regulators")
Satellite Receivers, Ltd. ("Satellite Receivers")
State of Alaska ("Alaska")
Third Millennium Communications & Electronics Co.. LLC ('Third Millennium")
United States Internet Industry Association ("USIIA")
Vivendi Universal. S.A.("Vivendi")
World Satellite Network, Inc. ("WSNet")
Writers Guild of America, Inc. ("WGA")

C. Opposition Wed February **25,2002**

EchoStar Communications Corporation. General Motors Corporation and Hughes Electronics Corporalion ("Applicants")

D. Reply Comments filed February **25,2002**

American Cable Association ("ACA")
Law and Communications Policy Seminar at Duke Law School **("Duke** Law")
National Consumers League, The National Grange of the Order of Patrons of Husbandry and Organizations Concerned with Rural Education ("National Consumers League")
The National Farm Union ("NFU")
The National Grange of the Order of Patrons of Husbandry ("National Grange")
Nonh Pacific International Television, Inc. ("NPIT")
National Rural Telecommunication Cooperative ("NRTC")
National Rural Utilities Cooperative Finance Corporalion ("CFC")
Paxson Communications Corporation ("Paxson")
RFD Communications, Inc. ("RFD-TV")
Satellite Receivers, Ltd ("Satellite Receivers")
US Action ("US Action")

II. Submissions in Response to the April **19,2002,** Public Notice

A. Petition **to** Deny and Motion to Dismiss filed May **20.2002**

National Council of La Raw ("NCLR)

B. Petition **to** Dismiss filed May **20,2002**

National Rural Telecommunications Cooperative ("NRTC")

C. Comments filed May **20,2002**

SES Americom, Inc. ("SES")

D. Opposition and Reply Comments filed May **30,2002**

EchoStar Satellite Corporation and Hughes Electronics Corporation ("Applicants")

E. Reply Comments filed May **30,2002**

National Association of Broadcasters ("NAB")

F. Responses filed June 4,2002

National Council of La Raza ("NCLC")
SES Americom, Inc. ("SES")

Appendix B
ECHOSTAR COMMUNICATIONS CORPORATION
Licenses and Authorizations Subject to Transfer

I. DBS Space Station Authorizations

EchoStar Satellite Corporation (Licensee)

Orbital Location	*FCC Id.*	*Satellites In Use*	*Authorized Spectrum***	
119° W.L.	DBS 88-01	EchoStar 7, EchoStar 6,	567 MHz	(21 frequencies)
	DBS 88-02	EchoStar 4		
110° W.L.	S2232	EchoStar 5	783 MHz	(29 frequencies)
61.5° W L	DBS 88-08	EchoStar 3	297 MHz	(11 frequencies)
148° W.L	52231	EchoStar 1, EchoStar 2	648 MHz	(24 frequencies)

II. Ku-Band Space Station Authorizations

EchoStar Satellite Corporation (Licensee)

Orbital Location	*FCC Id.*	*Authorized Spectrum**
83° W.L.	52142	1000 MHz
121° W.L.	52143	1000 MHz

III. Ka-Band Space Station Authorizations

EchoStar VisionStar Corporation (Licensee)

Orbital Location	*FCC Id.*	*Authorized Spectrum**
113° W.L	S2210	2000 MHz

IV. Earth Station Authorizations *(Listed by Call Sign and Type)*

EchoStar Satellite Corporation (Licensee)

E890611	Temp T/R	E980178	*TIR*	E860008	T/R
E950252	TIR	E980180	T/R	E920003	T/R
E950253	T/R	E990138	T/R	E920242	T/R
E950287	TIR	E990139	TIR	E950308	T/R
E950288	T/R	E990309	TIR	E980109	T/R
E970394	T/R	E990310	TIR	E980147	T/R
E980005	T/R	E980117	T/R	E000165	T/R
E980047	T/R	E010240	T/R	E950177	T
E980081	T/R	E010241	T/R	E980095	T
E980082	*TIR*	E010212	T/R	E980096	T
E980118	*TIR*	E970395	TIR	E980097	T
E980121	TIR	E970396	R		
E980128	TIR	E010240	TIH		
E980142	T/R	E010241	*TIR*		
E980143	T/R	E010242	T/R		
E980174	T/R	E010266	T/R		
		E020233	T/R		

* Authorized Spectmm assumes 2 times frequency re-use
** DBS authorized spectrum is based on 21 MHz channel bandwidth, guard band not included

Appendix C
HUGHES ELECTRONICS CORPORATION
Licenses and Authorizations Subject to Transfer

I. DBS Space Station Authorizations

DirecTV Enterprises, LLC and USSB II, Inc. (Licensees)

Orbital Location	FCC Id.	Satellites In Use	Authorized Spectrum**	
101° W.L.	DBS 8402 DBS 8402 S2369, S2430 DBS 81-07	DIRECTV 2, DIRECTV 3, DIRECTV 1R, DIRECTV 4S	864 MHz	(32 frequencies)
110° W.L.	DBS 8402 DBS 81-07	DIRECTV 1	81 MHz	(3 frequencies)
119° W.L.	DBS 8804 S2417	DIRECTV 5, DIRECTV 6	297 MHz	(11 frequencies)

II. Ku-Band Space Station Authorizations

Hughes Global Services, Inc. (Licensee)

Orbital Location	FCC Id.	Authorized Spectrum*
77° W.L. (STA)	KS39 (SBS-4)	1000 MHz

III. Ka-Band Space Station Authorizations

Hughes Network Systems, Inc. (Licensee)

Orbital Location	FCC Id.	Authorized Spectrum*	Orbital Location	FCC Id.	Authorized Spectrum*	Orbital Location	FCC Id.	Authorized Spectrum*
101° W.L.	S2132	2000 MHz	101° E.L.	S2187	2000 MHz	131° W.L.	S2338	2000 MHz
99° W.L.	S2133	2000 MHz	111° E.L.	S2188	2000 MHz	30° E.L.	S2339	2000 MHz
49° W.L.	S2185	2000 MHz	164° E.L.	S2189	2000 MHz	7.5° W.L.	S2340	2000 MHz
54° E.L.	S2186	2000 MHz	25° E.L.	S2190	2000 MHz	103° E.L.	S2341	2000 MHz

IV. Earth Station Authorizations *(Listed by Licensee, Call Sign and Type)*

DirecTV Enterprises, LLC		***Hot Telecom, Ltd.***		***Hughes Network Systems, Inc.***			
E950423	R	E000362	T/R	E880970	T/R	E881112	VSAT
E950424	R	E010187	T/R	E881109	T/R	E890426	VSAT
E980170	R	E020205	T/R	E890425	T/R	E890427	VSAT
E980341	R	E020206	T/R	E890627	T/R	E890428	VSAT
E930229	T	E020207	T/R	E900013	T/R	E890628	VSAT
E930304	T	E020208	T/R	E910612	T/R	E890629	VSAT
E930191	T/R	***USSB II, Inc.***		E920556	T/R	E890630	VSAT
E980285	T/R	E930437	R	E940460	T/R	E891001	VSAT
E980338	T/R	E930485	T/R	E940478	T/R	E891002	VSAT
E980340	T/R	***Hughes Global Services, Inc.***		E861092	Temp T/R	E900192	VSAT
E980473	T/R	E990024	T/R	E873438	Temp T/R	E900682	VSAT
E990159	T/R	E990055	Temp T/R	E000166	VSAT	E940455	VSAT
E950349	T/R	***Hughes Communications***		E880787	VSAT	E950471	VSAT
E010129	T/R	***Satellite Services, Inc.***		E880788	VSAT	E950472	VSAT
E010130	T/R	E960001	R	E880789	VSAT	E950473	VSAT
E990545	Temp T/R	E970079	R	E881110	VSAT	E990170	VSAT
DirecTV Latin America, LLC		E970094	R	E881111	VSAT	E970067	VSAT
E99023	T/R	E900013	T/R			E000166	VSAT

V. Wireless Licenses *(Listed by Licensee, Call Sign and Type)*

Hughes Electronics Corp.

Call Sign	Type	Call Sign	Type	Call Sign	Type
21AM	AC	KE4524	IG	WNIU649	IG
21AX	AC	KXU919	IG	WNEP883	MG
KE2356	IG	WNIR536	IG	WNEU909	MG

Hughes Communications Satellite Services, Inc.

Call Sign	Type
WPKJ833	IG

Hughes Network Systems, Inc.

WB2X1X	STA (EX)
WPLT306	IG

* Authorized Spectrum assumes 2 times frequency re-use.

** DBS authorized spectrum is based on 27 MHz channel bandwidth, guard band not included.

Appendix D
PANAMSAT COMMUNICATIONS CORPORATION
(Subsidiary of Hughes Electronics Corporalion)
Licenses and Authorizations Subject to Transfer

I. C and Ku-Band Space Station Authorizations

PanAmSat Licensee Corporation (Licensee)

Orbital Location	*Band*	*Authorized Spectrum**	*Orbital Location*	*Band*	*Authorized Spectrum**
133° W.L	C	1000 MHz	58° W.L	C/Ku	2000 MHz
127° W.L.	C	1000 MHz	45° W L	C/Ku	2500 MHz
125° W L	C	1000 MHz	43 W.L	C/Ku	3000 MHz
123° W.L.	C/Ku	2000 MHz	43° W.L.	Ku	
99° W.L.	C/Ku	2000 MHz	68.5°E.L	C/Ku	3600 MHz
95° W L	C/Ku	2500 MHz	68.5°E.L (STAs)		
91" W L	C/Ku	2000 MHz	72 E L	C/Ku	1500 MHz
74° W L	C/Ku	2000 MHz	166° E.L	C/Ku	2000 MHz
			169 E L	C/Ku	2000 MHz

II. Ka-Band Space Station Authorization,

PanAmSat Corp. (Licensee)

Orbital Location	*FCC Id.*	*Authorized Spectrum**	*Orbital Location*	*FCC Id.*	*Authorized Spectrum**
103" W L	S2191	2000 MHz	133 W.L	S2223	2000 MHz
124 5" E.L	S2427	2000 MHz	166 E L	S2224	2000 MHz
149° E.L.	S2428	2000 MHz	45° W L	S2221	2000 MHz
173" E.L.	S2429	2000 MHz	58° W L	S2220	2000 MHz
36" E.L.	S2192	2000 MHz	68.5° E L	S2225	2000 MHz
40° E.L	S2425	2000 MHz	72.7° E L	S2226	2000 MHz
48° E.L	S2426	2000 MHz			

IV. Earth Station Authorizations - *(Listed by Licensee, Call Sign and Type)*

PanAmSat Licensee Corp ***(Licensee)***

E950067	T	E980460	T/R	E970080	R	E980501	T/R
E000048	TIR	E980467	T/R	E970051	T	E980503	TIR
E000049	TIR	E980502	T/R	E000063	T/R	E990091	T/R
E000274	TIR	E990092	T/R	E000363	*TIR*	E990323	TIR
E000364	TIR	E990093	T/R	E010113	T/R	E990334	T/R
E000488	TIR	E990214	T/R	E010131	T/R	E990364	T/R
E010019	T/R	E990213	T/R	E010133	*TIR*	E990365	T/R
E010112	T/R	E990224	T/R	E4132	T/R	E2178	T/R
E7465	T/R	E990363	T/R	E900089	TIR	E3913	T/R
E881286	T/R	E990433	TIR	E920340	T/R	E860175	T/R
E890530	T/R	KA244	T/R	E920377	TIR	E881304	*TIK*
E940333	T/R	KA245	TIR	E930088	TIR	E900621	T/R
E940532	TIR	KA391	T/R	E940368	TIR	E900757	TIR
E950267	TIR	KA450	T/R	E950502	TIR	KL92	*TIR*
E950307	TIR	E950267	TIR	E95008	T/R		
E970352	T/R	E010118	Temp TIR	***PanAmSat Comm. Services, Inc.***			
E970391	T/R	EO I0280	T/R	E5702	T/R		
E970392	TIR	KA71	T/R				

V. Section 214 Authorizations

'anAmSat (Services, Inc. (Licensee)		*'anAmSat Co ier Sei Inc.*	
Section 214	ITC-214-19980102-00004/ ITC-98-052	Section 214	85-221
	FCN-NEW-20000515-00033	Section 214	ITC-85-069
Section 214	ITC-93-236		

* Authorized Spectrum assumes 2 limes frequency rc-us

APPENDIX E

MERGER SIMULATIONS OF THE ECHOSTAR-DIRECTV MERGER

A. The Role of Merger Simulation in Estimating Unilateral Effects

1. In recent years, the evaluation of mergers in differentiated product industries has focused increasingly on possible unilateral effects.[1] At the same time. a technique known as "merger simulation" has emerged as a frequently used tool for assessing the magnitude of possible unilateral affects in differentiated products mergers.[2]

2. Merger simulations can take on varying degrees of complexity. All simulations need knowledge or assumptions about demand. marginal costs, prices, and firm behavior in the relevant product and geographic markets. With information on the current values of these variables and assumptions about any merger-related changes that may occur, the simulation will predict the change in consumer welfare likely to result from the merger.

3. A thorough understanding of demand for the merging products and their substitutes is required for a realistic merger simulation. An understanding of how consumers respond to changes in the prices of products in the relevant markets is of prime importance. This information is conveyed by the price elasticities of demand. At a minimum. the simulation requires values for the own-price elasticities of demand for the merging products.[3] A richer model can be used if cross-price elasticities of demand are available as well.[4] Price elasticities for the products in the relevant markets can either be assumed or estimated using econometric techniques. They can also be inferred if reliable information on prices and marginal costs are available, as well as tractable assumptions about firm behavior.

4. Merger simulations also require knowledge of the marginal costs of production before and after the merger. These costs can be obtained in a number of ways. They can be estimated using econometric techniques or accounting data. In merger simulations. the prr-merger marginal costs are commonly inferred using the values of the price elasticities, prices, and assumptions about firm behavior. Information on cost reductions likely to result from the merger can be developed from engineering and business case analyses. Alternatively, simple assumptions about cost rrductions can be made.

5. Finally, assumptions must be made about the nature of competition between the firms. One of two forms of competition is generally assumed. These forms are "Benrand" competition and "Cournot" competition, named after the 19th Century French economists who developed the theory. Under Cournot competition, a firm chooses to produce the amount of output that maximizes its profits.

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[1] See. *e.g.*, Carl Shapiro. ***Mergers** with **Differentiated Products.*** 10 – SPG ANTITRUST 23 (1996)("It is fair to say that economic analysis of differentiated-products mergers at the Division typically focuses on unilateral effects. unless there are structural factors facilitating collusion following the merger or there is a history of collusion in the industry."); Jerry A. Hausman & Gregory K. Leonard, *Economic Analysis of Differentiated Producrs Mergers Using Real World Dara.* 5 GEO. MASON L. REV. 321 (1997) ("Economic analyses of the competitive effecls of mergers in differentiated product industries typically concentrate on the potential for so-called unilateral effects.").

[2] See. *e.g.*, Gregory J. Werden. ***Simulating** rhe Effects of Differentiated Producrs Mergers: A Pracricol Alternative to Structural Merger Policy,* 5 GEO. MASON L. REV. 363. 377-81 (1997); Jith Jayaratne and Carl Shapiro, *Simulating Partial Asset Divestitures to 'Fix' Mergers.* 7 INTERNATIONAL JOURNAL OF THE ECONOMICS OF BUSINESS 179-200 (2000).

[3] The own-price elasticity of demand for a product is defined as the percentage change in the demand for the product in response to a percentage change in its price.

[4] The cross-price elasticity of demand for a product *i* is defined as the percentage change in the demand for that product in response *to* a percentage change in price of product *j*.

Equilibrium is reached when the level of each firm's output is such that it could not earn higher profits by changing its output decision when taking its competitors' output decisions as fixed.' Under Benrand competition, firms compete by setting prices that maximize the firms' individual profits. Equilibrium under Benrand competition is reached when no firm could earn higher profits by changing its prices when it takes its competitors prices as fixed.[6]

6. Once these four pieces of information have been obtained. they can be applied to the simulation to predict the prices that would result from the merger. The pre- and post-merger prices. along with the information about demand, are then used to determine the change in consumer welfare due to the merger.[7]

B. MacAvoy's and Sidak's Merger Simulation

7. Dr. MacAvoy and Mr. Sidak. on behalf of NRTC and NAB respectively. provide merger-simulation analyses in support of their argument that the merger will result in unilateral effects that will harm consumers through increased prices. Following standard practice. their respective calculations of the predicted loss in consumer surplus are accomplished in three broad steps: (1) estimating (or assuming) demand elasticities; (2) determining pre- and post-merfer marginal cost: and (3) predicting post-merger prices based assumptions about firm behavior and market structure.

8. Dr. MacAvoy uses merger simulation to develop an estimate of the loss in consumer welfare that the mergers likely to cause in relevant geographic markets not served by cable. Using linear regression analysis, Dr. MacAvoy first estimates an elasticity of demand for DBS of -1.55.[8] Then. using average cost per unit as a proxy for marginal cost and assuming that in areas not served by cable the merged entity will price as a monopolist, Dr. MacAvoy predicts a post-merger price of $75.75 in those markets not served by cable.' Based on thebe estimate:, of pre- and post-merger prices for DBS. Dr. MacAvoy derives a projected loss in consumer surplus of between SI20 million and $700 million per year for areas not served by cable.[9][10]

9. **Mr. Sidak.** in contrast. estimates welfare losses not only for areas not served by cable. but also for areas that have access to cable. Mr. Sidak does not attempt to use econometric analysis to estimate the relevant demand elasticities. however. but rather simply assumes elasticities. which. he claims. are reasonable. For areas *not* served by cable. Mr. Sidak uses an estimate of the pre-merger price of DBS based on average revenue per customer[11] and an assumed own-price elasticity of demand for DBS

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[5] Sometimes the equilibrium is referred to as a "*Cournot-Nash Equilibrium.*" after John Nash. the American mathematician and economist who generalized both Cournot and Bertrand's models. See Jean Tirole, *The Theory of Industrial Organization.* Cambridge: The MIT Press, 1988 at 2 18-23

[6] *Id.* at 209-12

[7] Consumer surplus or welfare is the difference beiween the total value that consumers derive from consuming a product. which is the areas under the demand curve. and the amount they pay for the product, which is equal to the reciangle whose height is equal to the price and whose width is equal to ihe total quantity consumed.. As prices increase, consumer surplusdecreases. See Robert S. Pindyck and Daniel L. Rubinfeld. *Microeconomics.* New York: Macmillian Publishing Company, 1992. (p. 114).

[8] Dr. MacAvoy adopts a DMA as his unit of observation and uses average revenue per subscriber in the DMA as a proxy for price. NRTC Comments, MacAvoy Declaration ai 42.

[9] NRTC Comments, MacAvoy Declaration. Table Six

[10] Declaration of Paul W. MacAvoy on Behalf of the National Rural Telecommunications Cooperative. at 51

[11] Mr. Sidak's estimated pre-merger price is bared on data. supplied by Pegasus. concerning its average revenue per customer.

of -2.5 to calculate an implied marginal cost of $37.40.[12] Then using the monopoly pricing rule, Mr Sidak derives a predicted post-merger price of $62.35, which represents a markup of price over marginal cost of approximately 40%.[13]

10. For areas served by cable, Mr. Sidak uses both the Cournot and Benrand oligopoly models to estimate post-mrrger prices and associated consumer welfare losses.[14] Using the Cournot pricing rule, an assumed own elasticity of demand for DBS of -2.75 and estimates of pre-merger prices derived from average revenue per customer, Mr. Sidak calculates an implied marginal cost for DBS. He then derives a post-merger price for the combined DBS provider of $52.85. This represent, a price-cost markup of 18.1% and an increase of 7.28% over current EchoStar prices."

11. Mr. Sidak then uses the Benrand model to calculate an alternative estimate of the loss in consumer surplus. Under this alternative scenario. Mr. Sidak first assumes own price elasticities of demand of -3.0 for EchoStar and DirecTV and -1.95 for cable.[16] He then derives estimates of the cross elasticity of demand between EchoStar and DirecTV. These estimate? are based on the relationship between the diversion ratio and market shares. For market share darn. Sidak uses the FCC's 2001 *Video Competition Report."* For comparative price and estimates of marginal cost. Sidak relics on Morgan Stanley Dean Witter's estimate of average revenue per unit for DirecTV and EchoStar. Using these estimates of the own-price and cross-price elasticities of demand and estimates of market shares and marginal costs for each of the three MVPD service providers. Mr. Sidak concludes that the price, lor EchoStar and DirecTV offerings would increase by 4.0% and 1.4%. respectively.[18] He further concludes that the number of EchoStar subscribers would fall by 8.0%.[19]

12. Based on these calculations, Mr. Sidak estimates that the total annual deadweight loss[20] from the proposed merger would be $397 million under the Cournot pricing rule and $383 million under

[12] Mr. Sidak bases his estimate of pre-merger prices on an estimate of DirecTV's average revenue per unit. The Cournot pricing rule and an assumption of two firms is used to hack out the marginal cost. NAB Comments. Sidak Declaration at 20-21.

[13] *Id.* at *22,*

[14] In the case of Cournot competition. the structural equation is $\frac{(p-c)}{p} = \frac{HHI}{-10000 \cdot \eta}$, where p is the market price, c is the industry average marginal cost. HHI is the Herfindahl Hirschman Index. and η is the market elasticity of demand. In the case of Bertrand competition. the structural equation for each lirm *i. is:* $p_i = \frac{c_i \eta_i}{(\eta_i - 1)}$ where p_i is the price of the good set by firm i, c_i is the marginal cost of lirm i, *and* $\eta_{i,i}$ the own price elasticity of demand for good i

[15] NAB Comments. Sidak Declaration at 23-24

[16] Mr. Sidak calculates a cross-price elasticity of demand bctwccn EchoStar and DIRECTV of 0.184, and' a cross-price elasticity of demand between DirecTV and EchoStar 0.298. *Id* at 2K.

[17] *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, 17 FCC Record 1244 (2002).

[18] In performing this calculation, Mr. Sidak assumes that, after the merger, New EchoStar will chooses two prices -the price for EchoStar and the price for DirecTV – so as to maximize the joint profits of the merged entity. *Id.* at 26.

[19] *Id.* at *28*

[20] The deadweight loss is the loss in *total* surplus, including both consumers' surplus and producers' surplus that results from a rise in price. Broadly speaking. it is the triangular arc3 under the demand curve whose height (continued...)

the Bertrand pricing tule." Under the Cournot framework. the total annual consumer welfare loss is $691.1 million. Using the Bertrand model, annual consumer welfare losses are $704.1 million." Finally, Mr. Sidak estimates that, under a perfectly collusive outcome, the deadweight loss would rise to $1.16 billion per year.

C. Applicants' Merger Simulation Analysis

13. To rebut allegations that the merger will result in substantial consumer harms, the Applicants' present their own merger simulation analysis. Their merger simulation projects that the proposed merger is likely to offer REDACTED of net benefits to consumers. This benefit consists of two components. First, the benefits from the extension of local-into-local service to all DMAs are estimated to be REDACTED per year. Second, the projected reduction in marginal costs lowers MVPD prices which increase consumer surplus by REDACTED per year." The Applicants' merger simulation is described and evaluated below.[24]

1. Description of the Applicants' Model

14. The Applicants develop the four pieces of information required for the simulation through a combination of econometric estimation, calibration. and inference. The Applicants undertake to estimate the functional form of demand rather than assume or infer values for the price elasticities. To model MVPD demand, the Applicants, following the work of Steven Berry. adopt a discrete choice model known as the "nested logit."[25] In this model a consumer's decision process can be thought of as a series of sequential steps. In the first stage. the Applicants assume that a consumer chooses between over-the-air television, cable service, and the DBS product group. or "nest." containing EchoStar and DirecTV service. If the consumer chooses the DBS product group. he then must select between DirecTV or EchoStar service. In addition, the econometrician must select one of the goods as the outside good. The outside good is the good by which the "quality" of all the other goods is compared. The Applicants treat over-the-air television as the outside good. The functional form, along with the choice of the outside good, determines the parameters that must be estimated. Three categories of parameters must be

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(...continued from previous page)
represents the change in price and whose base is the change in quantity demanded that results from the increase in price. The deadweight loss can be approximated by the formula for the area of a triangle: $\frac{1}{2}(P_1 - P_0)(Q_0 - Q_1)$. See. W. KIP VISCUSI, JOHN M. VERNON & JOSEPH E. HARRINGTON, JR., ECONOMICS OF REGULATION AND ANTITRUST 86-88 (3d ed. 2000); F.M. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 24-25 (1990).

[21] *Id.* at 29. Mr. Sidak further claims that the majority of the deadweight loss would occur in areas not passed by cable television systems. where both the increase in price and the decrease in the number of DBS subscribers would be higher than in areas passed by cable television systems. *Id.*

[22] *Id.* at 29. The consumer welfare loss is the sum of the deadweight loss plus any surplus that is transferred from consumers to producers. The consumer welfare loss thus will always exceed the deadweight welfare loss associated with an increase in market power.

[23] Letter from Applicants to Marlene Donch. Secretary, FCC, Attachment ("Analysis of the EchoStar-Hughes Merger: Competitive Effects and National Pricing"). transmitted by letter from the Applicants to Marlene Donch (June 27. 2002) at 53. ("Applicants June 27, 2002 Competitive Effects Ex Parte").

[24] An evaluation of the claimed benefits of increases local-into-local service is contained in Section V.C *supra*

[25] Steven T. Berry. *Estimating Discrete Choice Models of Product Differentiation*, 25 RAND J. ECON. 242 (1994).

estimated: the nest strength parameters. the price parameters. and the mean utility parameters. The specification used by the Applicants requires the estimation of three equations.[26]

15. One problem that arises when using mark-level data to estimate the nested logit model is that it is not possible to obtain consistent estimates of the nest strength and price parameters using simple regression methods." A technique known as instrumental variables estimation is required **to** ensure that the estimated parameters are consistent. Ideally. one would jointly estimate the values of all ***of*** the parameters of demand using a systems instrumental variable approach.[28] Application of an instrumental variables technique, however, can be difficult since it requires the existence of other variables. referred to as instruments, with distinct characteristics." The Applicants repon they are unable to find appropriate instruments to allow consistent estimation of the nest strength parameter.[30] Instead, they use the underlying functional form of demand in the nested logit model to develop a relationship between the nest strength parameter. market shares, and the diversion ratio." The value of the nest strength parameter is inferred from this relationship. The Applicants also encounter difficulties when estimating the parameters on price in the system of demand. They report that they are unable to develop sufficient variation in the price of their own product.; to accurately estimate the effect of DBS prices on consumer choice. The Applicants resort to estimating the parameter on the price of cable and assume that the parameter value also holds for the two DBS products.

16. The final sets **of** parameters necessary to fully specify demand are the mean utility levels for each product in each market. If cenain measurable aspects of product quality are expected to change following the merger, the impact **of** these quality elements on mean utility can be estimated at this **stage.** The Applicants propose that their merger will lead to a wider deployment of satellite delivery of local broadcast stations. Given the difficulties in estimating the other parameters describing demand for the

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[26] The three equations are the cable equalion: $\ln(S_C) - \ln(S_A) = X_C\beta + \alpha p_C + \xi_C$.

the EchoStar equation: $\ln(S_E) - \ln(S_A) = X_E\beta + \alpha p_E + \sigma \ln(\frac{S_E}{S_E + S_D}) + \xi_E$, and

the DirecTV equaiion: $\ln(S_D) - \ln(S_A) = X_D\beta + \alpha p_D + \sigma \ln(\frac{S_D}{S_E + S_D}) + \xi_D$,

where S_A, S_C, S_E, and S_D are the market shares of over-the-air television, cable, EchoStar, and DirecTV. The mean utility parameters are $X\beta$ and ξ, h e price parameter is α. and the nest strength parameter is a.

[27] A consistent estimator is one for which the parameter estimate converges to the parameter value of the population as sample size increases. See Takeshi Amemiya, ADVANCED ECONOMETRICS. Harvard University Press. 1985 at 95.

[28] JEFFREY M. WOOLDRIDGE, ECONOMETRIC ANALYSIS OF CROSS SECTION AND PANEL DATA. MIT Press. 2002, Chapier 8.

[29] The instruments must be correlated with the within-group shares, $\ln(\frac{S_D}{S_E + S_D})$ and $\ln(\frac{S_E}{S_E + S_D})$, and uncorrelaied with ξ.

[30] Technically, h e Applicants were unable to estimate ihc nest strength parameter with any precision. The Applicants' results indicate that the nest strength parameter lies between -1.2 and 4.0 with a probability of 95%. See Letter from Applicants to Marlene Donch. Secretary. FCC. Attachment ("IVs_for_sigma.log"), transmitted by letter from the Applicants to Marlene Dortch (August 19, 2002).

[31] The diversion ratio is defined as the fraction of sales lost due io a price increase by one of the merging products that would be captured by the other merging product.

DBS products, the Applicants simply calculate the value of mean utility for each product in each market that makes the market shares predicted by the demand system equal to those observed. The effect of the expansion of DBS local-into-local service is estimated at a later stage.

17. The Applicants next estimate the marginal costs *of* the products and adjust for post-merger efficiencies. This stage incorporales the estimated demand parameters with assumptions about the competitive interaction of the firms lo infer current marginal costs. The Applicants assume Bertrand competition, *i.e.*, that all firms in all markets sei prices that maximize profits. This behavioral assumption implies a unique set of marginal costs that would generate the prices and quantities observed in the marketplace. The Applicants calculate this set of marginal costs and assume that these are the current costs of the firms. The Applicants also introduce the reductions to marginal cost that are expected to result from the merger at this stage. These reductions are applied to the current marginal costs to obtain an estimate of the marginal costs of the firms following the merger.

18. Once the demand and the marginal costs of the products are fully specified. the post-merger behavior of the firms can be simulated to predict the prices and quantities that are likely to result from the merger. This calculation involves the estimated demand functions as well as the estimated post-merger marginal costs. The differences in the post-merger world must also be accounted for at this stage as well. One change is that a single firm will now set the national prices for the two DBS products. The merged firm will set national prices of :he two DBS products so that the sum of profits from the two products is maximized. The other change is that the marginal cost of the two DBS products is lower due to merger efficiencies. Up to this point, the analysis has only examined the **4,984** cable franchise areas in the sample. At this stage, the areas where no cable is available must be accounted for. This additional market must be included in the profit-maximizing decision process of the firms as well." Given this structure, a set of prices and quantities that will hold in each market following the merger can be calculated. The changes in prices are then convened into changes in welfare in each of the markets.

19. In a standard merger simulation analysis. the analysis would be completed at this stage. However, due to some of the problems with estimating the demand system, the Applicants must make further adjustments. The Applicants account for the effect of the expansion of local-into-local service into **DMAs** ranked 71-210. Two specific effects are measured – the direct effect of an increase in the quality of DBS on DBS consumers. and the indirect effect the increased quality will have on cable consumers through the pricing reactions of cable companies.

20. Estimating the direct effect proceeds in two steps. In the first step, the Applicants use the past history of the introduction of local-into-local service to predict the likely increases in DBS market shares that would result from the introduction of local-into-local service in new markets. In step two the Applicants convert this into a dollar value by calculating the equivalent decrease in DBS prices that would generate a similar increase in DBS market shares. The Applicants claim this represents the value the average consumer places on the introduction of local-into-local service.

21. According to the Applicants. the indirect effect of expansion of local-into-local service occurs because cable companies must compete more vigorously against the higher quality DBS competitor. As in measuring the direct effect, the Applicants measure the indirect effect by observing the outcomes in markets where local-into-local **has already been** introduced. The outcome to be measured here **is** a reduction in the cable rates relative to what they would have been in the absence of local-into-**local** service. Once the predicted cable rate "reduction" has been obtained. this dollar value is assumed to benefit all cable subscribers **in** DMAs ranked 71-210, as well as those who switch to cable as a result of the lower price.

[32] The addition of the area not served by cable brings the number of markets included in the simulation to 4.985.

22. The Applicants estimate the benefits from the extension of local-into-local service to all DMAs to be REDACTED per year. This amount is combined with the Applicants' claimed net benefits of REDACTED per year due to the reductions in marginal costs to obtain an overall estimated net benefit from the merger of REDACTED per year.[33]

2. Critique of Applicants' Merger Simulation Analysis

23. Our most serious reservations about the Applicants' merger simulation lie with their demand estimation and resulting estimates of elasticity. The Applicants estimate the own-price elasticity of demand for EchoStar to be REDACTED and REDACTED for DirecTV, and further estimate that the cross-price elasticities of demand for DirecTV and EchoStar are respectively REDACTED and REDACTED with respect to the prices the other DBS provider." These firm-level elasticities imply a price elasticity of demand for DBS of REDACTED and a price elasticity of demand for MPVD of REDACTED.

24. As we noted earlier, the Applicants have used over-the-air television to be the "outside good" in their nested logit model of MVPD demand. The model require.. that the mean utility, or "quality," of the outside good be constant across all markets.[35] However this basic assumption clearly fails to hold here because the "quality" of over-the-air television exhibits substantial variation across different markets. In the Glendive Montana DMA there is one full-power television station, while the Los Angeles DMA has twenty-four. Very few consumers would consider over-the-air television to he equal in those two DMAs. The end results of this misspecification is that the calibrated mean utilities of cable and DBS service are biased downwards in markets with higher quality over-the-air television and upwards in markets with lower quality broadcast telsvision. Since markets with higher quality over-the-air television tend to have larger populations. we believe the aggregate effect is to underestimate the value consumers place on cable and DBS services, and therefore an underestimation of the market power possessed by MPVD producers.

25. The nested logit structure used by the Applicants is generally preferred over the "flat logit." that is the choice model where the consumer only makes a "one step decision" rather than the sequential choice process outlined above. This is because it imposes fewer restrictions on the cross-price elasticities of demand between the products. However. the nested logit form does impose the same restrictions as the flat logit at each step of the decision process. It is only when moving between steps that these restrictions are relaxed.[36] The implication for the decision process chosen by the Applicants is that customers choosing to leave the DBS product group following a price rise must move into cable and over-the-air television in proportion to the existing market shares of cable and over-the-air television. The nesting structure thus imposes the constraint that REDACTED of the customers leaving the DBS market must shift to over-the-air television. while the remaining REDACTED will choose cable." This is substantially different from information presented by the Applicants which suggests that the econometric model will overstate the number of persons leaving DBS for over-the-air television by

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[33] Letter from Applicants to Marlene Dortch. Secretary. FCC. Attachment ("Analysis of the Echostar-Hughes Merger: Competitive Effects and National Pricing"). transmitted by letter from the Applicants to Marlene Dortch (June 27. 2002) at 53. ("Applicants June 27. 2002 Competitive Effects Ex Parte").

[34] Letter from Applicants to Marlene Donch. Secretary, FCC. Attachment ("Scaled_div13-17.6_Simulation.nb"), transmitted by letter from the Applicants to Marlene Dortch (August 19, 2002).

[35] Berry (1994) at 253

[36] Greene. ECONOMETRIC ANALYSIS, 4th Edition. New Jersey: Prentice Hall. 2000 at 870

[37] Letter from Applicants to Marlene Dortch, Secretary. FCC. Attachment ("logit_regressions.log"), transmitted by letter from the Applicants to Marlene Dortch (July 12, 2002).

REDACTED.[38] This forces us to question the appropriateness *of* the nesting structure chosen by the Applicants. If the basic structure chosen by the Applicants is mis-specified, the estimated parameters will bear no relationship to the true population parameters that govern the behavior of consumers and be useless in predicting how consumers will respond to changes in the prices and qualities of the product5 in this market.

26. The Applicants claim that they were unable to find an appropriate instrument for estimating the nest strength parameter, instead calibrate it. Using information on the percent of customers switching from DirecTV to EchoStar due to price and cost reasons, the nest strength parameter is calibrated based upon the diversion ratio. We find this procedure questionable for a number of reasons. Calibration in merger simulation models is traditionally done following estimation of the demand parameters, not prior to the estimation." To the extent that this calibration is limiting the responses of consumers to price. it is inappropriate and prejudges the results. The diversion ratio is derived from interviews DirecTV conducts with customers that have, voluntarily or involuntarily, dropped service. The Applicants have chosen to use REDACTED to calibrate the nest strength parameter. This ratio reflects the percent of DirecTV customers switching to EchoStar for claimed price and cost reasons in the survey. The Applicants reason that the diversion ratio can be directly related to price elasticities. We note that the diversion ratio for all surveyed customers between July 1999 and December 2001 was REDACTED. and for those customers that voluntarily left DirecTV it was REDACTED. The diversion ratio was over REDACTED among households in non-cabled areas that voluntarily left DirecTV in 2001.[40] A higher diversion ratio implies that EchoStar and DirecTV are closer substitute. and that post-merger prices are likely to be higher than those estimated by the Applicants.

27. The next step in the demand estimation stage is to estimate the parameter on price. The Applicants did not use variations in DBS pricing or variation\ in the equipment and installation charges to estimate this parameter. Instead, the price parameter is estimated solely on information about the cable systems and cable prices. Material submitted by the Applicants clearly indicates that this assumption may be appropriate when price is normalized to be per unit of volume or weight or other appropriate measure of quantity. however that is not the case with these data." In fact, the Applicants appear to disregard the self-imposed constraint as well. When estimating the price parameter using cable system data. they separate the sample in two, one group of cable systems offering expanded basic tiers and the other group not offering those tiers. Estimation of the price parameter is done separately for each sub-;ample. The resulting estimates are then averaged to get a final value which is used in the model. This procedure is highly questionable. While one might wish to argue that cable systems without expanded basic tiers offer substantially different products, this differentiation is exactly the sort that the Berry model. used by the Applicants is intended to address. If the Applicants believe that the price elasticities in areas served by cable systems without an expanded basic tier are significantly different, then the full simulation. including calibration of the nest strength parameter, should be performed separately for each sub-sample. These issues with the estimation and application of the price parameter lead us to question whether the Applicants estimated parameter bears any relationship whatsoever to the influence of price on the decision to purchase DBS services.

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[38] Applicants June 27, 2002 Competitive Effects Ex Parte at 8

[39] Werden ***(1997)*** at 376

[40] Letter from Applicants to Marlene Donch. Secretary, FCC. Attachment ("churn 1201 data.zip"). transmitted by letter from the Applicants to Marlene Dortch (July 12, 2002).

[41] Gregory J. Werden & Luke M. Froeb. *The Effects of* Mergers *in Differentiated* Producrs *Industries: Logit* Demand and *Merger Policy.* 10 J. L..ECON. & ORG. 407 (1994) at fn. 5. **Also** see Margaret **E.** Slade. Marker *Power* and *Joint* Dominance *in UK Brewing.* Working Paper. Department of Economics. University of British Columbia. May 2002 for an application that **does** not assume the parameters on price are equal.

28. In order to simulate the post-merger MPVD industry. the Applicants adjust the calibrated pre-merger marginal costs for the merger-specific cost reductions that they anticipate. We have numerous concerns with their hypothesized cost reductions. For example many of the benefits seems to affect fixed costs and so it is unlikely that there would be any benefit to consumers. Moreover some of the cost savings such as reduced subscriber acquisition costs may reflect a lowering of the subsidy in equipment and installation that the Applicants now offer, and so harm consumers. Other benefits were too speculative or lacked credibility. These concerns were addressed in detail in our discussion of the Applicants claimed benefits in Section V.C. *supra*.

29. In summary, we find the Applicants model to be severely flawed and their results highly suspect. At the most fundamental level the Applicant's nested logit model is a complete misspecification of a model for individuals not served by cable. Consumers without access to cable have the choice between DirecTV, EchoStar, and over-the-air. In fact. the most critical step in the construction of any discrete choice model is the accurate delineation of the choice set of individuals in the market. The Applicant's model fails to reflect the actual choices of consumers without access to cable. This failure results in flawed model that cannot be corrected on an ad hoc basis. The correct modeling of consumer's choices of MVPD services requires separate models for both consumers without access to cable and consumers with access to cable. Moreover. the Applicants use of churn data is an additional failure to recognize that consumers without access to cable cannot chum to cable. Use of the Applicant's chum data and nested logit model is incorrect and cannot represent the choices of consumers without access to cable or the sensitivity to price of consumers without access to cable. As a result we find that we can give little credence to their estimates of the demand for MPVD products or the projected consumer benefits that the Applicants claim will result from the merger.

3. Staff Merger Simulation Sensitivity Analysis:

30. The Commission staff also undertook a sensitivity analysis of the Applicants' merger simulation.[42] We estimated the range of magnitudes of harm that MVPD consumers are likely to experience if the proposed merger is approved. Our measure of consumer welfare loss is the loss in consumer surplus. The central question is by how much consumer surplus decreases when price increases. As explained above. the record suggests that the two DBS services are closer substitutes to each other than DBS is to cable. In the Applicants' model this degree of substitutability is affected by the "nest strength" parameter. Table I below indicates the magnitude of consumer losses that result in the Applicants model for modest increases in the nest strength parameter. It demonstrates that for small increases in this parameter above those assumed by the Applicants. consumer harms are likely to be significant. If most consumers view the two services as close substitutes. then the nest strength parameter would be very close to one. This appears likely given the similar product offerings, similar pricing. and the similar technology for delivery (satellite transmission. satellite dish and set-top box) used by the Applicants. In such a case, estimated consumer losses in the Applicants' model would be significantly greater.

[42] We note that we are unable to rely definitively on either Mr. Sidak's or Dr. MacAvoy's welfare calculations, because we lack confidence in the demand elasticities they use for their calculations. In particular, Mr. Sidak assumes that the DBS own price elasticity is equal to the cable price, elasticity. -2.5. in areas with cable and somewhat higher. -2.75 in areas with cable. NAB Comments. Sidak Declaration at 24. Thus, these elasticity estimates are merely informed guesses rather than econometric estimates. We also have concerns with the elasuciiy estimates used by Dr. MacAvoy. In particular. while we recognize the difficulties in obtaining data, we are concerned about Dr. MacAvoy's use of regional variation in average revenue per customer as a proxy for price variation. NRTC Comments, MacAvoy Declaration at 42.

REDACTED TABLE

31. The above described sensitivity analysis used the Applicants' model assumes that : (1) consumers have a choice of over-the-air television. cable. or either DBS provider: (2) that the competitors engage in Benrand competition; and (3) that ihe DBS providers charge a single national price. In reality, however, many customers. particularly in rural areas, do not have access to cable. In addition, as discussed above. we find that New EchoStar would have the incentive to price discriminate across geographic regions and therefore the profit maximizing prices would differ in different geographic regions. In order to address these unrealistic assumptions in the Applicants' model, the Commission staff undertook a further sensitivity analysis that assumed Cournot behavior and took account of the fact that some customers lacked access to cable.

32. The Commission staffs merger simulation found that the estimated elasticities of demand used by the Applicants to be unrealistic and overly sensitive to questionable assumptions. Staff also questioned the usefulness of the simulation developed by Mr. Sidak on behalf of NAB. Mr. Sidak simply assumes a value for the elasticity and proceeds from there. This is not an approach that we are willing to pursue. Our preference is for a simulation that relies as much as possible on actual observation of consumer behavior rather than broad assumptions. Similarly. staff found that we cannot use the simulation provided by Dr. MacAvoy on behalf of NRTC. MacAvoy's simulation only enamines the impact of the merger on areas lacking access to cable television. We believe that a reasonable simulation must examine a broader spectrum of areas served by the Applicants.

33. Actual price and cost data are available to us from the record. These data and the equilibrium conditions of the Cournot model of firm behavior are used in our analysis to infer an elasticity. We tentatively use this elasticity to evaluate possible effect.; of the merger until additional verifiable and reliable econometric evidence is presented in hearing.

34. We begin our analysis of consumer welfare with prices for the most popular services of the present DBS competitors. EchoStar's most popular service is "America's Top 100." The most popular service offering of DirecTV is "Total Choice.'' We assume that DBS firms maximize their profit both before and after the merger. The pre-merger prices are known for EchoStar's "America's Top 100" and DirecTV's 'Total Choice." The pre-merger price of America's Top 100 submitted was REDACTED" and 'Total Choice" is REDACTED.[44]

35. Given marginal costs of firms in the market and the number of firms in the market *(2)*.we calculate a composite price (average price) and a composite marginal cost (average cost). Then. an implied market elasticity is calculated. Our calculated implied market elasticity is REDACTED a year. In addition the Commission staff examined the likely impact of the merger in the Cournot model considering both. price discrimination between cabled and uncabled areas, and a uniform national price. These estimates of losses are based on the actual costs of firms, prices of the firm, and implied own-price elasticites of demand. Thus, we again find that the likely magnitude of the harms is significant. Moreover, the value of the efficiencies necessary to counterbalance these harms significantly exceed the Applicants' own claimed benefits, which, as we discuss above. are not supported by the record.

[43] This calculation is based on confidential information on programming. churn. and equipment costs supplied by ihe Applicants. See Response to Feb 4th *2002* EchoStar's Data Request Interrogatories Tab 14-20 Exhibit VII-1, Exhibit VIII-2, Exhibit 8-c. Exhibit IV (A)-1 and Exhibit V(B)(1), Exhibit VI(A)(2)

[44] This calculation is similarly bared on confidential information on programming, churn, and equipment costs supplied by the Applicants. See Response to Feb 4th 2002 DirecTV Data Requesi Interogatory Schedule VIII(a). Latham and Watkins July 18 *2002* ex pane Schedulc VI.B.a.(i)